

# **Drug abuse in pregnancy and neonatal effects**

*Edited by*

**JOSÉ LUIS REMENTERÍA**

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*with 34 illustrations*

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DEDICATION

**Nere aitatxo eta amatxori**

# PREFACE

The pregnant woman for a period of approximately 40 weeks is in a unique circumstance. She is the caretaker of a living, developing group of cells—initially called the embryo and subsequently, the fetus—that culminates in the birth of an infant.

During this period of time the fetus is a virtual prisoner—totally subject to the environment imposed on it by the mother. In this age of the “drug culture,” millions of pregnancies in the United States and elsewhere are affected by the mother’s liberal use of various quantities of medication, narcotics, and alcohol. Slowly, information is being gathered about the effects of maternal drugs on the fetus and infant.

It would be most important for those caring for the pregnant woman and subsequently for those caring for her infant to be aware of some of the dimensions and consequences of drug ingestion during pregnancy. These same concerns will also pertain to the pregnant woman who is not a drug abuser, but a drug user.

As in any collective work by some thirty authors, one can expect to find areas of difference. I have attempted to respect the opinions of the various authors but have indicated with an “Editor’s note” where there may be another contributor with a different point of view.

Many of the areas covered in the book will have been of recent (and perhaps controversial) developments. Therefore utilization of references is encouraged to back up as much of the material in those areas as possible. If controversies do exist in any area discussed by an author, it is to be expected that some of the other points of view may be contained in the author’s discussion to permit a more objective evaluation.

Since drug abuse is not strictly a medical problem, this book has been written from a multidisciplinary approach. It is hoped that the book will become a reference work for people interested in this problem—physicians, nurses, psychologists, social workers, legislators, drug counselors, and students.

**José Luis Rementería**



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SECTION I

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**The pregnant drug addict**



# Chapter 1

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## **THE FETUS OF THE DRUG-ADDICTED WOMAN: CONCEPTION, FETAL WASTAGE, AND COMPLICATIONS**

**José Luis Rementería and Lek Lotongkhum**

When the drug-addicted woman becomes pregnant, her developing fetus is exposed to a variety of negative experiences; hence the fetus is at risk and the mother's pregnancy enters the high-risk category. In the course of the addict's pregnancy, the fetus may be exposed to multiple drugs (narcotics, medicines, alcohol), which makes it difficult to elicit a direct cause-and-effect relationship of any drug of abuse with the problems encountered by the infant in the postnatal period. Many addicted mothers may not seek medical care when they find themselves pregnant, many may be experiencing poor nutritional intake, and some will be subjected to various infections (e.g., syphilis, hepatitis). Any of these factors may have an effect on the fetus and the subsequent outcome of the infant in the neonatal period.

Interest in the problems of the fetus of the drug-using mother intensified during the 1950s, when investigators began reporting more frequently about the withdrawal symptoms found in the infant.<sup>34,63</sup> During the past twenty years, information on the offspring of drug-addicted mothers has increased enormously. Although most of the information has been obtained by observing the effects on the infant in the postnatal period, there have been some reports on the effects of drugs on the developing fetus, which will be discussed in the following paragraphs.

### **FREQUENCY OF CONCEPTION**

It was previously thought that women who utilized narcotics had a reduced reproductive capacity.<sup>18,66,73</sup> Gaulden et al.<sup>18</sup> reported that in a group of 72 addicted mothers, heroin use in large doses appeared to produce amenorrhea, irregular periods, and suppression of ovulation. Loss of libido and an interest in sex had also been reported in adult addicts who used large doses of narcotics.<sup>35,64</sup>

In our series of 227 drug-addicted mothers (see Chapter 22 for more specific details), there were 150 mothers whose entire obstetrical history was known. Of the 150 women studied, 284 fetuses and infants were born while their mothers were using drugs and 239 fetuses and infants were born while their mothers were not using drugs. The number of pregnancies per drug-addicted mother was 3.4; the control population had 2.5 pregnancies

#### 4 The pregnant drug addict

**Table 1-1.** Obstetrical data on 150 drug-addicted mothers and 227 control subjects encompassing the period from January 1, 1973, to June 30, 1976

	Number of drug-addicted mothers (150)	Number of controls (227)
Pregnancies, total	515	573
Pregnancies per mother	3.4	2.5
Products of conception (including multiple births)	523	578
Induced abortions	44 (8.5%)	50 (8.7%)
Pregnancies, uninterrupted*	471	523
Products of conception, uninterrupted*	479	528
Infants born alive	422 (88.1%)	491 (93.0%)
Fetal wastage†	57 (11.9%)	37 (7.0%)
Abortions, spontaneous†	49 (10.2%)	31 (5.8%)
Stillbirths†	8 (1.7%)	6 (1.1%)
Neonatal deaths‡	12 (2.8%)	3 (0.6%)
Perinatal deaths	20 (4.7%)	9 (1.8%)
Deaths after 28 days of age‡	8 (1.9%)	0 (0%)

\* Corrected figures; induced abortions eliminated.

† Based on total number of births.

‡ Based on number of deaths per 1000 live births.

per mother (Table 1-1). This would indicate that a woman using narcotics has as much probability of becoming pregnant as would a woman not using narcotics. In fact, the reproductive capacity of the drug-addicted group appeared to be slightly greater than that of the control group. Other reports have also shown that drug-addicted women appear to be as fertile as their nonaddicted counterparts.<sup>9,46</sup>

A further breakdown of the obstetrical data of the 150 drug-addicted mothers (Table 1-2) indicates that there were as many pregnancies conceived and gestated when the mother was using narcotics (1.8 pregnancies per mother) as there were when she was not (1.6 pregnancies per mother). These data would refute the argument that the addict's normal- to large-sized family was conceived prior to her becoming involved with narcotics.

Many of these mothers were using light to moderate dosages of narcotics, and this may be the reason why they did not seem to have any alteration in their reproductive capacity.<sup>53</sup>

#### FETAL AND PERINATAL MORTALITY

Fetal wastage and perinatal mortality have been recognized as potential complications for the offspring of drug-addicted mothers, particularly those who use heroin. The following data have been compiled over a three and one-half year period and give an insight into this important problem.

**Spontaneous abortions.** There were 49 spontaneous abortions in 479 births (150 drug-addicted mothers) for a 10.2% wastage rate (Table 1-1). Among the control mothers

**Table 1-2.** Breakdown on the obstetrical data of 150 drug-addicted women showing the outcome of pregnancies conceived or gestated when narcotics were and were not used

	Total number of addicted mothers (150)	Drug-addicted mothers: no narcotics used	Drug-addicted mothers: narcotics used
Pregnancies	515	236	279
Pregnancies per mother	3.4	1.5	1.9
Products of conception	523	239	284
Induced abortions	44	16	28
Pregnancies, uninterrupted*	471	220	251
Products of conception, uninterrupted*	479	223	256
Infants born alive	422 (88.1%)	201 (90.1%)	221 (86.3%)
Fetal wastage†	57 (11.9%)	22 (9.9%)	35 (13.7%)
Abortions, spontaneous‡	49 (10.2%)	18 (8.1%)	31 (12.1%)
Stillbirths‡	8 (1.7%)	4 (1.8%)	4 (1.6%)
Neonatal deaths‡	12 (2.8%)	3 (1.5%)	9 (4.1%)
Perinatal deaths	20 (4.2%)	7 (3.1%)	13 (5.1%)
Deaths after 28 days of age‡	8 (1.9%)	6 (3.0%)	2 (0.9%)

\*Corrected figures; induced abortions eliminated.

†Based on total number of births.

‡Based on number of deaths per 1000 live births.

the wastage rate was 5.8%—almost one half that in the addicted group. Both of these figures conform to the estimated 10% to 15% spontaneous abortion rate that occurs in the pregnancies of the general public.<sup>26,58</sup>

When the total number of spontaneous abortions occurring in the drug-addicted group is subdivided (Table 1-2), 8.1% occurred to addicted mothers who had not used narcotics during those particular pregnancies, and 12.1% occurred to mothers who had used narcotics during pregnancy. Although spontaneous abortions occurred more frequently in pregnancies of narcotic users, both of the preceding figures (8.1% nonusers and 12.1% users) are still within the expected spontaneous abortion rate for the general public (10% to 15% of all births).

It would thus appear that drug-addicted mothers do not have a greater than expected spontaneous abortion rate when compared with the reported rate for the general public, although from our study the rate is definitely higher when compared with that of our own control group of mothers. Most of the 150 mothers were using methadone during their pregnancies; this fact may be of significance when evaluating the data on spontaneous abortions. It is possible that various narcotics or drugs might have a different effect on the incidence of spontaneous abortions.

There have been several reports indicating an increased fetal wastage in pregnancies of heroin-addicted mothers.<sup>52,61</sup> Although still controversial, some reports have indicated that mothers using lysergic acid diethylamide (LSD) have a higher than expected spontaneous abortion rate.<sup>30,45,70</sup> LSD was a drug commonly used in the 1960s and early 1970s by many of the poly-drug users. Since many drug-addicted mothers are poly-drug users,

it would be exceedingly difficult to incriminate one drug or group of drugs as being the cause of spontaneous abortions.

**Induced abortions.** It was found that in the population of our study the number of induced abortions in the drug-addicted women (8.5%) and the controls (8.7%) were similar (Table 1-1). The drug-addicted mother appears to take as much advantage of the liberal abortion programs as does the control mother.

**Stillbirths.** In 479 births to drug-addicted mothers, there were 8 stillbirths (1.67%) or 16.7 stillbirths per 1000 births. The rate among the control group was 6 stillbirths (1.14%) in 528 births for a value of 11.4 stillbirths per 1000 births. This appears to indicate a slightly higher stillbirth rate among drug-addicted mothers compared with control mothers.

Of the 8 stillbirths, 4 (1.6%) were born to mothers using narcotics, and 4 (1.8%) were born to mothers not using narcotics; thus it can be seen that both rates are similar. The narcotic-using mothers who had the 4 stillbirths were not in any recognized treatment programs and were all using illicit drugs at the time of their stillbirths. There was no consistent, similar drug pattern among the 4 mothers with the stillbirths.

The stillbirth rate in a large (39,215 births) national study was 22.2 stillbirths per 1000 births.<sup>47</sup> This figure would make the number of stillbirths in our drug addict mother population comparable to the number found in the general population.

The present data were compiled since January, 1973, when most of the mothers were utilizing methadone. In an evaluation prior to 1973, Rementería et al.<sup>60</sup> reported a stillbirth rate of about 60 stillbirths per 1000 births. At the time of that report only 14 of 46 mothers were in methadone programs or had sampled methadone; the remaining women were utilizing heroin. Other investigators have also reported an increase in the number of stillbirths in heroin-addicted mothers.<sup>53,61,65</sup>

Drug-addicted mothers attending recognized methadone programs would be receiving daily, consistent dosages of methadone, which would help to ensure a stable narcotic level in their maternal serum in contrast to the narcotic serum levels of the heroin or illicit methadone-using mother. With more stable narcotic levels in the maternal serum of the program-attending mother, the fetus is less likely to go into withdrawal, to release meconium, to experience fetal distress, and possibly to become a stillbirth (see later discussion on fetal withdrawal).

However, methadone is not without its own danger, as indicated by Harper et al.,<sup>25</sup> who reported 4 stillbirths from 104 mothers in their methadone maintenance programs, particularly in the first week of its use.

**Neonatal mortality.** There were 12 neonatal deaths in 422 live births for a mortality rate of 2.8% (28.4 neonatal deaths per 1000 live births). Among the control subjects there were 3 neonatal deaths in 491 live births for a mortality rate of 0.6%. The neonatal mortality rate was more than four times greater in the addicted infants compared with the control infants.

One of the main causes of death in the drug-exposed infants appeared to be prematurity. Of the 12 infants, 9 had weights below 1500 grams; only 1 infant weighed over 2500 grams. None of the deaths was related to the neonatal narcotic withdrawal syndrome.



The neonatal mortality rate for the United States in 1973 was 12.9 deaths per 1000 live births.<sup>76</sup> Thus the neonatal mortality rate among infants of drug-addicted mothers was more than twice the rate in the general population.

High neonatal mortality rates have been reported in infants of drug-addicted mothers, usually because of the infant's prematurity.<sup>34,55,57,67,79</sup> Neonatal deaths from narcotic withdrawal syndrome are rare, and in the experience of one author (JLR) there has not been a single death in our series due to the withdrawal syndrome.

**Perinatal mortality.** There were 20 perinatal deaths in 430 births in our series for a mortality rate of 4.65% (46.5 deaths per 1000 births). In our control population there were 9 perinatal deaths in 497 births for a 1.8% mortality (18.1 deaths per 1000 births). The perinatal death rate in the drug addict population was more than twice that of the control population.

In a large collaborative, nationwide study involving over 39,000 births, there was a perinatal mortality of 38.6 deaths per 1000 births.<sup>47</sup> The perinatal mortality among the fetuses and infants of the addicted mothers appears to be slightly higher than the national figures obtained in the collaborative study.

Higher fetal wastage and neonatal death rates have been reported in the drug-addicted mother, particularly if she uses heroin.<sup>31,53,64</sup>

**Mortality after the neonatal period.** There were 410 infants of drug-addicted mothers who survived the neonatal period; 8 of these subsequently died (Table 1-3), 5 in the first year of life. These 5 deaths in 422 live births gives 11.8 deaths per 1000 live births for this period (28 days to 1 year) compared with 4.7 deaths per 1000 live births in the national population.<sup>76</sup> In our control population there were 488 infants who survived the neonatal period, with no record of any mortality in the group.

Of the 8 infants who died, 2 were born to mothers who had utilized narcotics during their pregnancies; 6 were born to drug-addicted mothers at a period when they were not using narcotics. This fact would indicate the importance of social factors (desired or acci-

**Table 1-3.** Various data on 8 infants of drug-addicted mothers who died after the neonatal period encompassing the time period from January 1, 1973, to June 30, 1976

Infant	Birth weight (grams)	Age at death (months)	Cause of death	Use of narcotics during pregnancy
RO	2268	2	Illness	Yes
SZ	3204	2	SIDS	No
BA	2945	3	SIDS*	Yes
KI	666	4	SIDS	No
DR	2722	9	Septicemia	No
JO	2580	18	Pneumonia	No
SO	1871	18	Drowned in bathtub	No
MU	3175	18	Pneumonia	No

\*There were 2 additional cases of SIDS infants (prior to 1973) where the mother was utilizing narcotics during the pregnancy.